

REMARKS

Claims 1-20 are currently pending. Claims 1-6, 9 and 19 have been amended for readability. New claim 20 has been added herein. The Title of the application has also been amended. Reconsideration is respectfully requested.

Amendments to the Specification

The Office Action includes an objection to the Title as not being sufficiently descriptive. The Title has been amended, and withdrawal of the objection is respectfully requested.

Rejection under 35 U.S.C. 112

The Office Action includes a rejection of claim 5 under 35 U.S.C. 112, second paragraph as allegedly being indefinite. The Office objects to the language "wherein the aspherical lens provides the Fizeau lens." It is believed that one of ordinary skill in the art would readily understand that the phrase indicates that the aspherical lens is the Fizeau lens, as noted by the Examiner, and, thus, the claim is not indefinite. It is noted that similar language is used in connection with various surfaces as recited in claims 3 and 4, to which Office did not object. Nevertheless, in an effort to expedite prosecution, claim 5 has been amended as suggested by the Examiner for readability. Withdrawal of the rejection is respectfully requested.

Art Rejections

The Office Action includes a rejection of claims 1-5, 8 and 12-18 under 35 U.S.C. 103(a) as allegedly being unpatentable over the Puryaev patent (U.S. Patent No. 4,468,122) in view of the Ono patent (U.S. Patent No. 4,697,927). This rejection is respectfully traversed.

Claim 1 recites a method of processing an optical element having a spherical surface, the method using light beams of a spherical beam type, the spherical beam type including beams having one of substantially spherical wave fronts and substantially plane wave fronts. The method comprises providing a first interferometer apparatus having an interferometer optics, wherein the interferometer optics comprises an aspherical lens configured to transform a beam of a first spherical beam type into a beam of a second spherical beam type, the aspherical lens having at least one aspherical surface. The method also comprises

arranging the optical element in a beam path of an incident beam of a third spherical type provided by the interferometer optics, interferometrically taking a first measurement of first wave fronts generated by reflecting the incident beam from the spherical surface of the optical element, and determining first deviations of the spherical surface of the optical element from a target shape thereof in dependence on the first measurement. The method further comprises arranging the aspherical lens in a beam path of a measuring beam provided by a beam source of a second interferometer apparatus such that the measuring beam passes the aspherical lens and is reflected from a reflecting surface, wherein the measuring beam, between the aspherical surface and the reflecting surface, is one of the first spherical type and the second spherical type, interferometrically taking a second measurement of second wave fronts generated by reflecting the measuring beam from the reflecting surface, and determining second deviations of the at least one aspherical surface of the aspherical lens from a target shape thereof in dependence on the second measurement.

It is respectfully submitted that the Office's rejection does not make out a *prima facie* case of obviousness. Even if the Puryaev patent and the Ono patent were hypothetically combined as suggested by the Office, for the sake of argument, the resulting hypothetical method would not meet the limitations recited in claim 1. The Puryaev patent does not disclose a method comprising providing a first interferometer apparatus having an interferometer optics, wherein the interferometer optics comprises an aspherical lens configured to transform a beam of a first spherical beam type into a beam of a second spherical beam type, as recited in claim 1. The Office points to the Puryaev optical system "6" (citing Fig. 4 and col. 4, lines 47-49) consisting of two lenses 26 and 27, where one of the surfaces 28 and 29 is disclosed as being aspherical, as allegedly corresponding to the aspherical lens recited in claim 1. (Office Action at p. 3.) The Office further asserts that the Puryaev patent discloses a first spherical beam type as being "divergent" and a second spherical beam type as being "plane." (Office Action at p. 3.) Contrary to the Office's suggestion the Puryaev patent contains no disclosure or suggestion that either lens 26 or 27 of lens system "6" is an aspherical lens that transforms a beam of a first spherical beam type into a beam of a second spherical beam type, as recited in claim 1. As noted in the specification, a spherical beam type includes beams having substantially spherical wavefronts or substantially flat wavefronts which are spherical in the sense that the radius of curvature is infinite. (Specification at p. 4, lines 26-30.) The Puryaev patent is silent on how the aspherical lens (either 26 or 27) impacts wavefronts. Moreover, the Office's characterization of a "divergent" beam as meeting the claim limitation of a first spherical beam type is

unsupported by the Puryaev patent, and the Office has not provided a supporting citation. Clearly, divergent waves can have wavefronts that are other than spherical. Thus, the Puryaev patent does not disclose providing a first interferometer apparatus having an interferometer optics, wherein the interferometer optics comprises an aspherical lens configured to transform a beam of a first spherical beam type into a beam of a second spherical beam type, contrary to the Office's suggestion.

It is noted that the Puryaev patent mentions spherical wavefronts, namely, "The optical system of such interferometer provides for forming a spherical wavefront directed to the reference surfaces A and B, the deviation of the wavefront from the sphere being equal at the maximum to  $\lambda$  -- the wavelength of the light source 1 at the worst." However, this statement does not constitute a disclosure of an aspherical lens (either 26 or 27) that transforms a beam of a first spherical beam type into a beam of a second spherical beam type, as recited in claim 1.

Accordingly, the Puryaev patent does not disclose providing a first interferometer apparatus having an interferometer optics, wherein the interferometer optics comprises an aspherical lens configured to transform a beam of a first spherical beam type into a beam of a second spherical beam type. Moreover, the Office's reliance on the Ono patent does not make up for this deficiency. Accordingly, withdrawal of the rejection and allowance of claim 1 are respectfully requested for at least these reasons.

Claims 2-5, 8 and 12-18 depend from claim 1. Accordingly, these claims are allowable at least by virtue of dependency. Withdrawal of the rejection and allowance of claims 2-5, 8 and 12-18 are respectfully requested for at least this reason.

The Office Action also includes a rejection of claims 6, 7 and 9-11 under 35 U.S.C. 103(a) as allegedly being unpatentable over the Puryaev patent in view of the Ono patent, and further in view of the Ichihara patent (U.S. Patent No. 6,312,373). This rejection is respectfully traversed. Claims 6, 7 and 9-11 depend from claim 1, whose patentability has been discussed above. Moreover, the Office's reliance on the Ichihara patent does not make up for the deficiencies of the Puryaev patent noted above. Accordingly, claims 6, 7 and 9-11 are allowable at least by virtue of dependency. Withdrawal of the rejection and allowance of claims 6, 7 and 9-11 are respectfully requested.

The Office Action includes a rejection of claim 19 under 35 U.S.C. 102(b) as allegedly being anticipated by the Puryaev patent (U.S. Patent No. 4,468,122). Notwithstanding the Office's position regarding the patentable weight of the phrase "the at least one aspherical surface having been interferometrically measured . . ." it is respectfully

submitted that claim 19 is distinguishable over the Puryaev patent at least for reasons set forth above with regard to claim 1. Accordingly, withdrawal of the rejection and allowance of claim 19 are respectfully requested.

**New Claim 20**

New claim 20 has been added herein to round out the scope of protection sought. It is respectfully submitted that claim 20 is patentable over the applied references at least for reasons set forth with regard to claim 1, and allowance of claim 20 is respectfully requested.

**Conclusion**

In light of the above amendments and remarks, withdrawal of the objection and rejections of record, and allowance of this application, are respectfully requested. The Examiner is invited to call the undersigned if a telephone call could help resolve any remaining items.

Respectfully submitted,



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